

Hammond Sanitary District (HSD) Long Term Control Plan

A. Alternative Evaluation

Alternative 1:	Complete Separation	See Figure 1
Alternative 2:	Store and Treat	See Figure 2
Alternative 3:	Convey and Treat	See Figure 3
Alternative 4:	NPD-016 CSO Basins*	See Figure 4
Alternative 5:	NPD-016 CSO Basins**	See Figure 5
Alternative 6:	Sewer Separation and Store and Treat	See Figure 6
Alternative 7a:	NPD-016 CSO Basins** and Cloth Media Filters	See Figure 7
Alternative 7b:	NPD-016 CSO Basins** and High Rate Clarification	See Figure 7

* 4 discharges per typical year
** 1 discharge per typical year

B. Introduction and Background

This Long Term Control Plan (LTCP) to mitigate CSOs is a revision to HSD's original plan submitted to IDEM in 1997 and updated in June 2015 and is being conducted pursuant to requirements under the federal Clean Water Act. The revised plan assumes that the Hammond Sanitary District is providing wastewater treatment services for the current customer communities of the City of Whiting, the Town of Griffith and the Town of Highland. The District's continued service of these customer communities is subject to change in the future as a result of pending litigation and other disputes between HSD and those communities. As described in greater detail below, the recommended alternative also incorporates a 33 MG storage basin completed by September 2014, which HSD constructed pursuant to a 1999 agreement with EPA and IDEM. This basin is expected to eliminate 97% of all CSOs in those areas.

C. Selected Plan (June 5, 2015)

Of the four alternatives considered, Alternative 4a (NPD-016 CSO Basins) was selected as the recommended alternative to mitigate CSOs based on numerous factors, including cost-effectiveness and overall environmental benefit. Alternative 4a is expected to reduce CSOs 91% in fifteen years and – unlike complete separation – will ensure that all incoming wastewater will receive some treatment prior to discharge. A description of the selected plan is as follows:

West Branch Grand Calumet River - HSD has already constructed a 33 MG CSO storage basin and force mains which transport CSOs from the Columbia, Johnson and Sohl pump stations to the basin. Improvements to the WWTP have already been constructed such that the CSO basin is expected to overflow four times or less during a typical year.

East Branch Grand Calumet River - HSD plans to construct a 9 MG CSO storage basin along with pump station modifications and force mains. The CSO storage basin will store flows from the Kennedy North drainage area. The CSO basin is sized to provide 100% capture of the 1 year- 1-hour storm and settling and disinfection of all discharges. Improvements to the WWTP will be constructed such that the CSO basin will be dewatered in 48 hours.

West Branch Little Calumet River - HSD plans to construct a 3.5 MG CSO storage basin sized to capture flows from the 173rd and Forest, Hohman-Munster and Jackson CSO pump stations. The CSO basin is sized to provide 100% capture of the 1-year 1-hour storm and settling and disinfection of all discharges. Improvements to the WWTP will be constructed such that the CSO basin will be dewatered in 48 hours. HSD also plans to completely separate the sewers in the Calumet-Munster drainage area and construct an interceptor to transport the increased sanitary flow to the WWTP.

East Branch Little Calumet River - HSD plans to construct a 12 MG CSO storage basin along with pump station modifications and force mains. The CSO basin will store CSOs from the Walnut, Indianapolis Boulevard and Kennedy Ejector CSO pump stations. The basin is sized to provide 100% capture of the 1-year 1-hour storm and settling and disinfection of all discharges. Improvements to the WWTP will be constructed such that the CSO basin will be dewatered in 48 hours.

The projects identified in Alternative 4a are projected to be completed by 2030, subject first to the revised LTCP's overall approval by IDEM and EPA.

D. Selected Plan (March 1, 2018)

HSD responded to two sets of questions raised by U.S. EPA and IDEM in 2015 and 2016 and met with U.S. EPA and IDEM in July 2016. U.S. EPA requested that HSD investigate alternatives that provided a greater level of CSO treatment than provided in HSD's recommended plan in 2015 (4 overflows per year). U.S. EPA also requested that HSD investigate costs to provide for a level of control to one or two overflows per year. The alternatives described below will meet the one overflow per year criteria. The level of control required by HSD is still subject to approval by EPA and IDEM.

Of the seven alternatives considered, Alternative 7a (NPD-016 CSO Basins and Cloth Media Disk & Filters) was selected as the recommended alternative to mitigate CSOs based on numerous factors, including cost-effectiveness and overall environmental benefit. Alternative 7a is expected to virtually eliminate untreated CSO discharges. A description of the selected plan is as follows:

West Branch Grand Calumet River - HSD has already constructed a 33 MG CSO storage basin and force mains which transport CSOs from the Columbia, Johnson and Sohl pump stations to the basin. HSD will expand the CSO basin by 25 MG to a total capacity of 58 MG. Improvements to the WWTP have already been constructed such that the CSO basin is expected to overflow one time or less during a typical year.

East Branch Grand Calumet River - HSD plans to construct a 14 MG CSO storage basin along with pump station modifications and force mains. The CSO storage basin will store flows from the Kennedy North drainage area. The CSO basin is sized to discharge only once per year, with settling and disinfection of all discharges. The CSO basin will be drained within 48 hours.

West Branch Little Calumet River - HSD plans to separate the Jackson CSO drainage basin and construct a relief interceptor to transport all sanitary flow to the WWTP. HSD also plans to completely separate the sewers in the Calumet-Munster drainage area and construct an interceptor to transport all sanitary flow to the WWTP.

HSD plans to construct two Cloth Media Disk Filter (CMDf) facilities, one near the Indianapolis Boulevard CSO outfall and one near the Kennedy Ejector CSO Pump Station. These facilities will

each consist of a first flush storage tank (1.0 and 0.5 MG for Indy Boulevard and Kennedy Ejector respectively), chemical storage, cloth media disk filter facility and UV disinfection. All discharges will be treated to meet NPDES permit limits. No more than once per year, there may be small discharges of dilute untreated combined sewage consistent with HSD achieving water quality standards under the Clean Water Act.

The projects identified in Alternative 7a are projected to be completed by 2033, subject first to the revised LTCP's overall approval by IDEM and EPA.

DRAFT

**Alternative #1
Complete Separation**

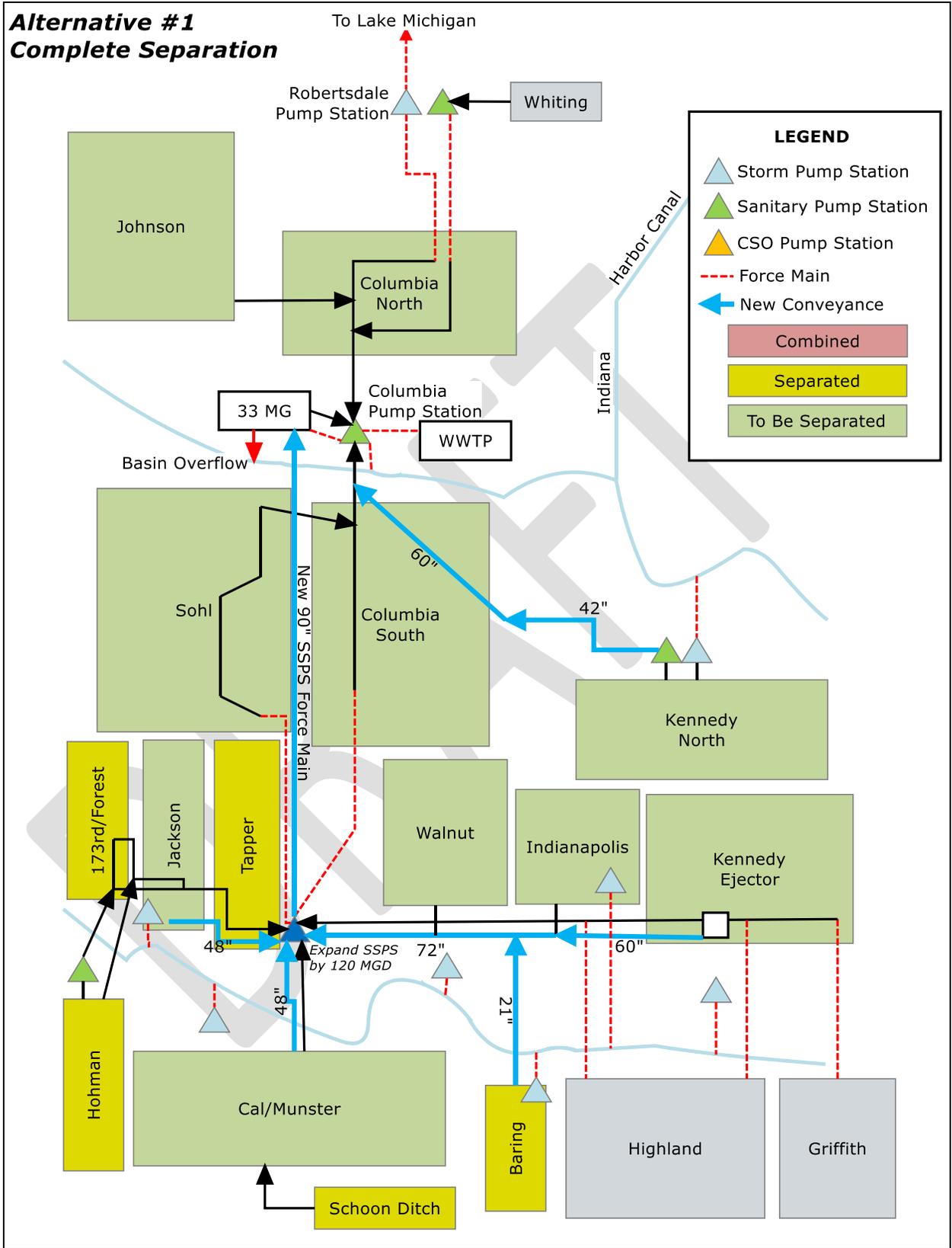


Figure 1 – Schematic of Alternative 1, Complete Separation

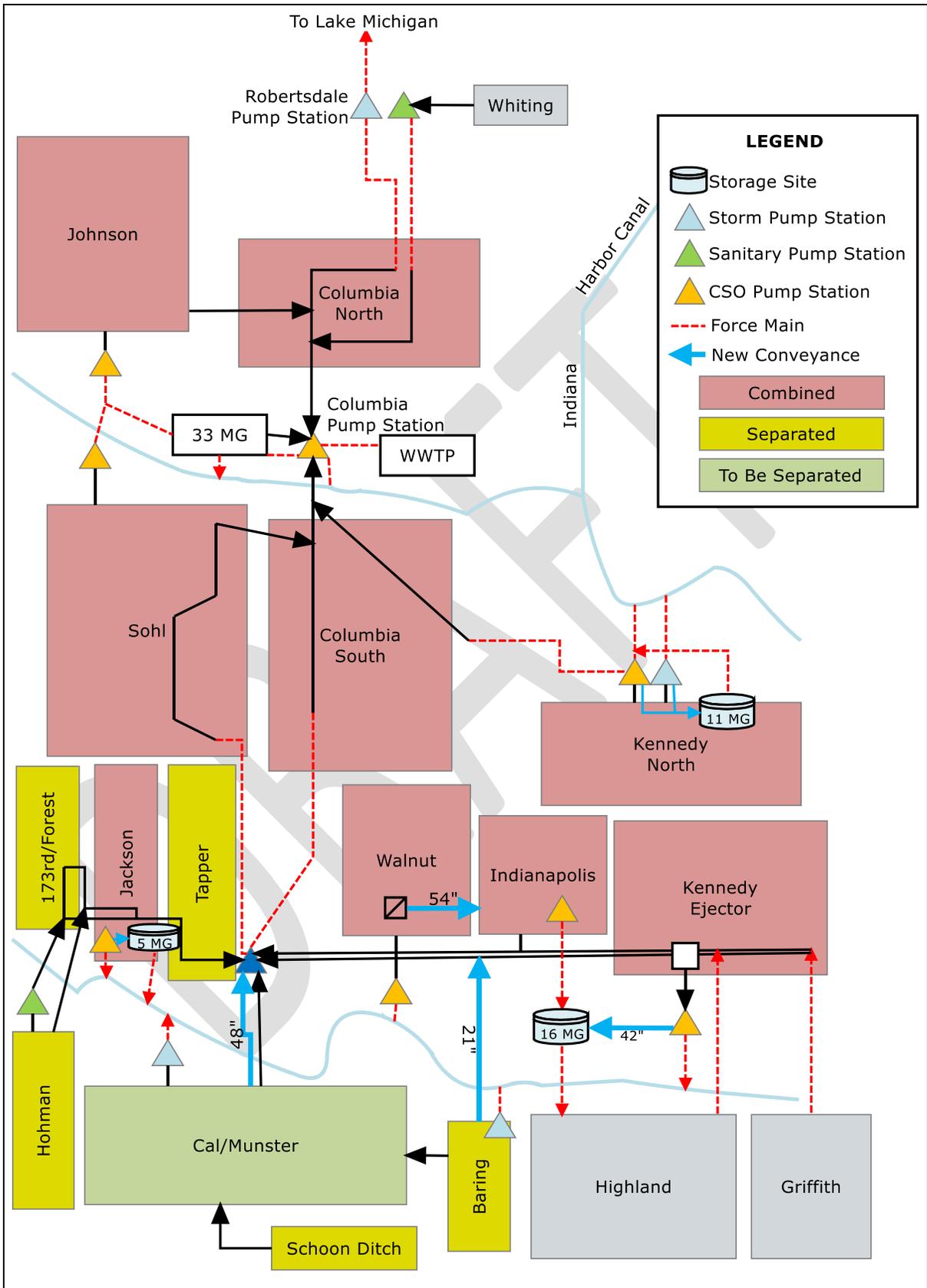


Figure 2 – Schematic of Alternative 2, Store & Treat

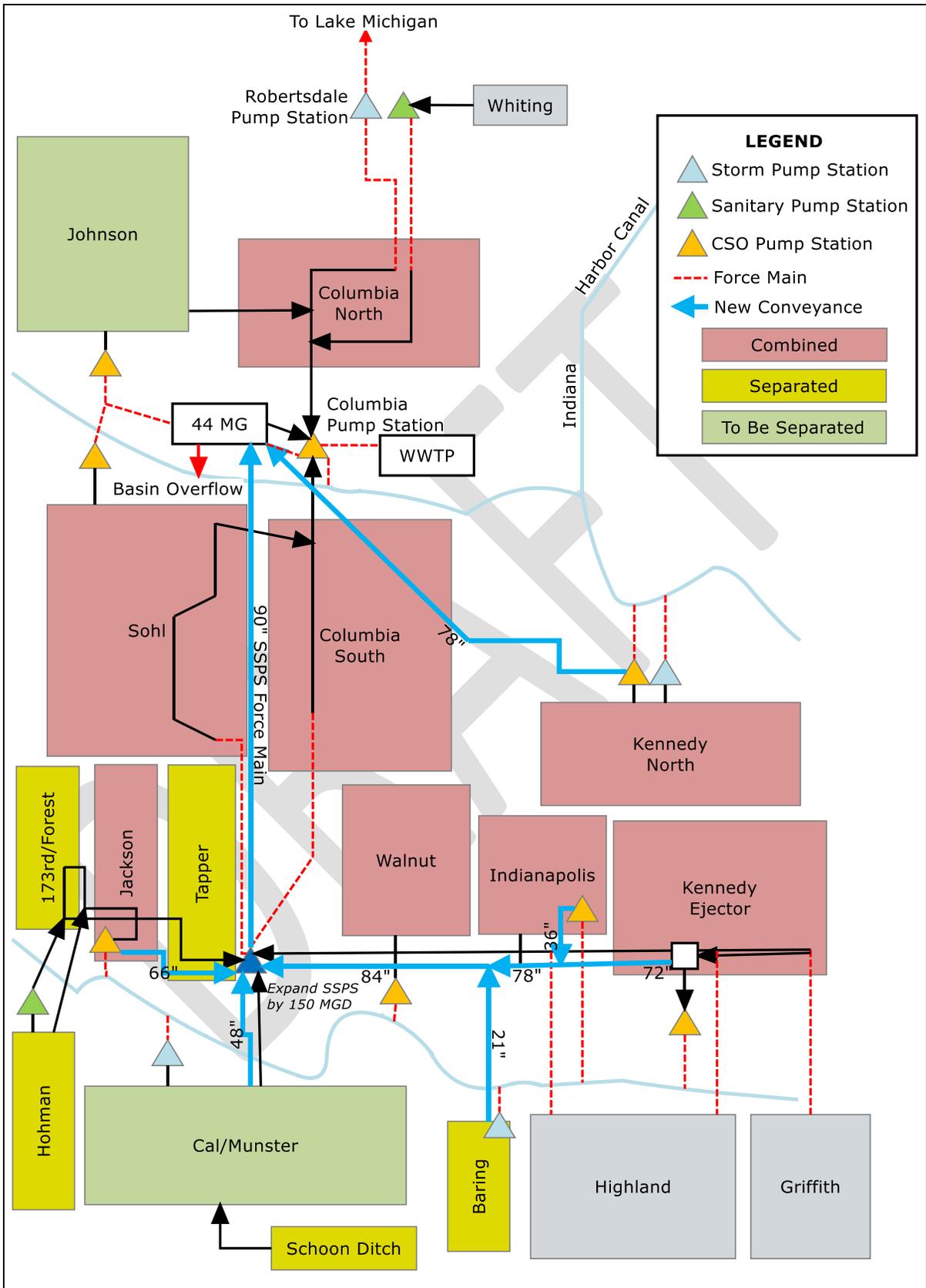


Figure 3 – Schematic of Alternative 3, Convey & Treat

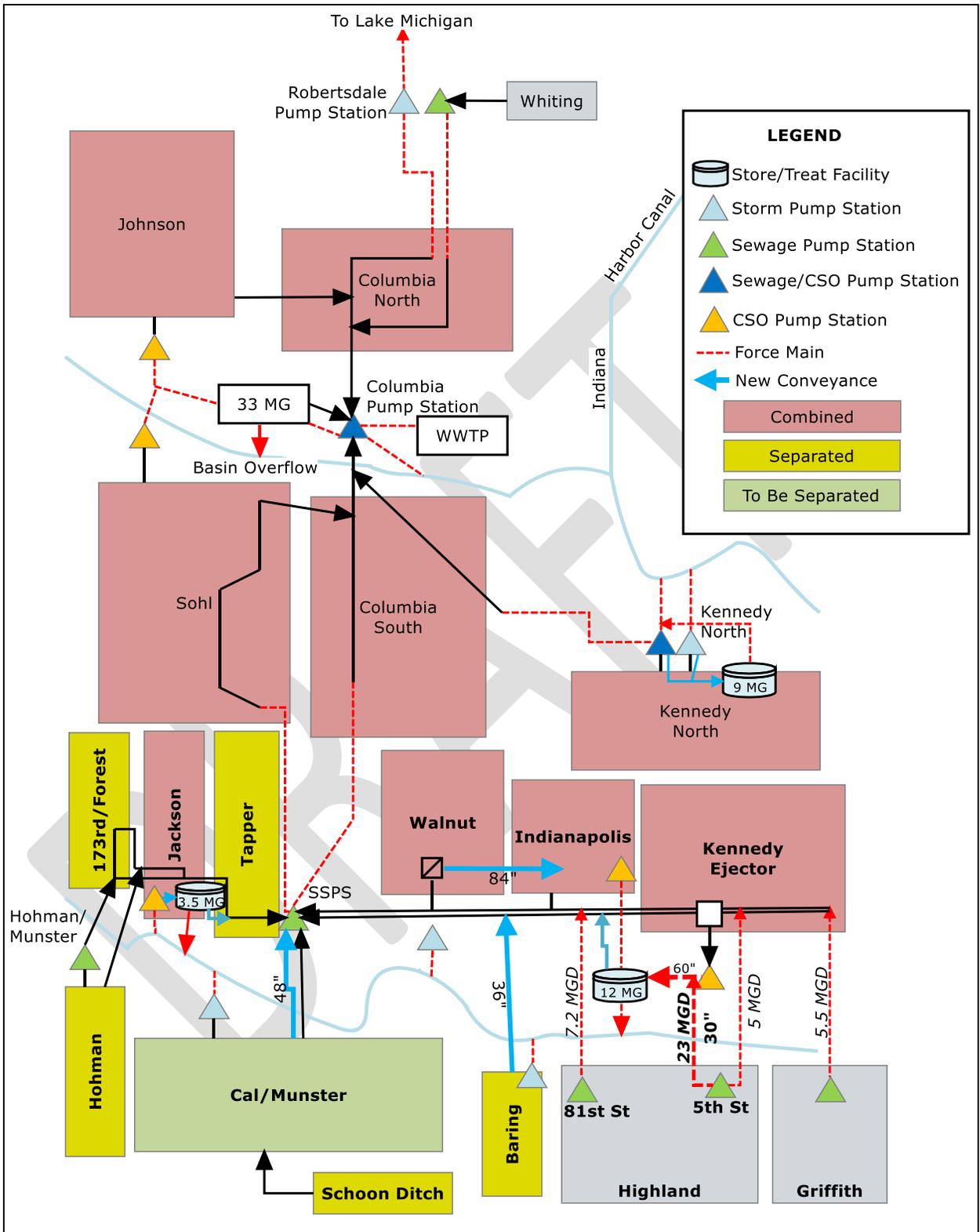


Figure 4 – Schematic of Alternative 4, NPD-016 Basins, 4 discharges per year

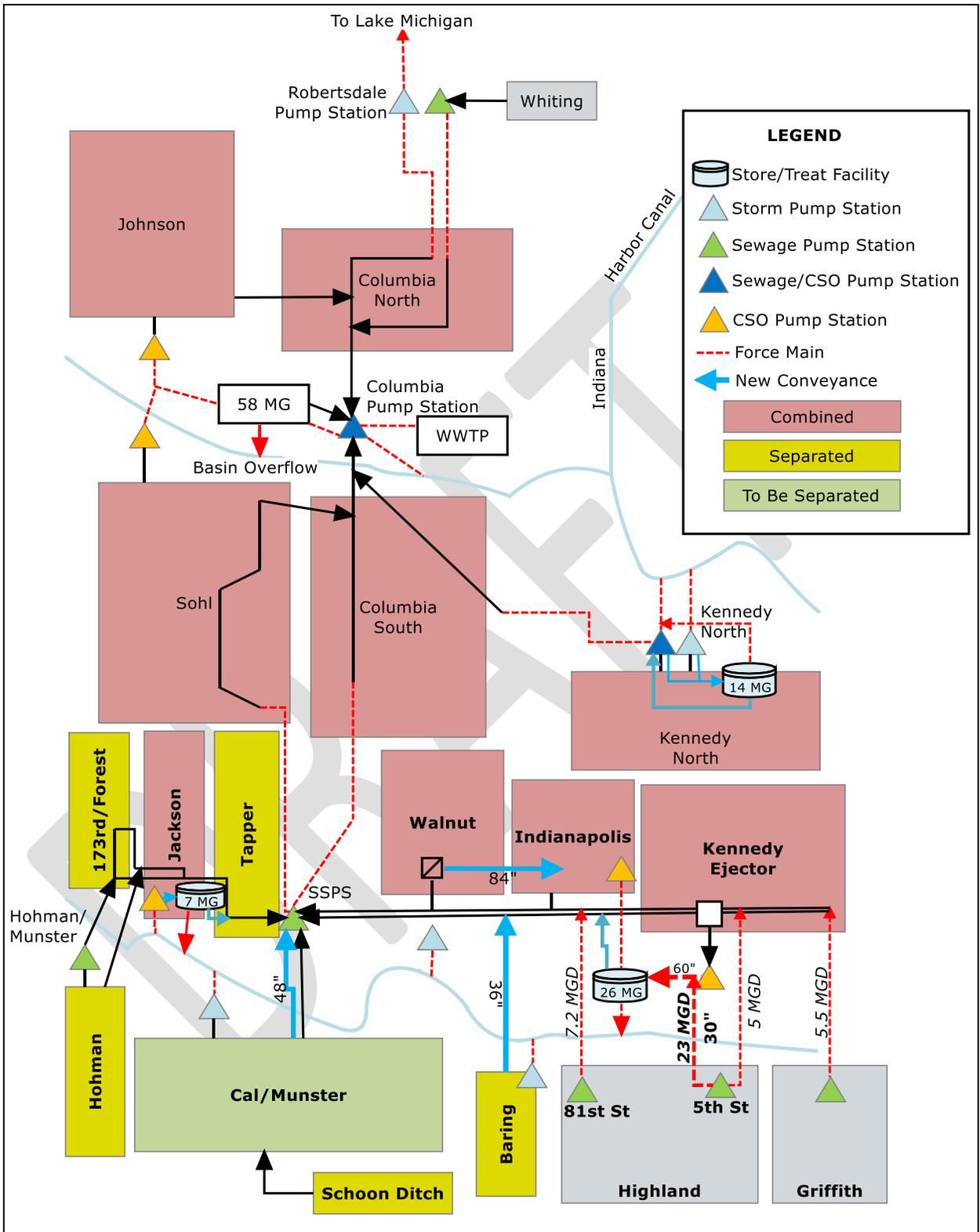
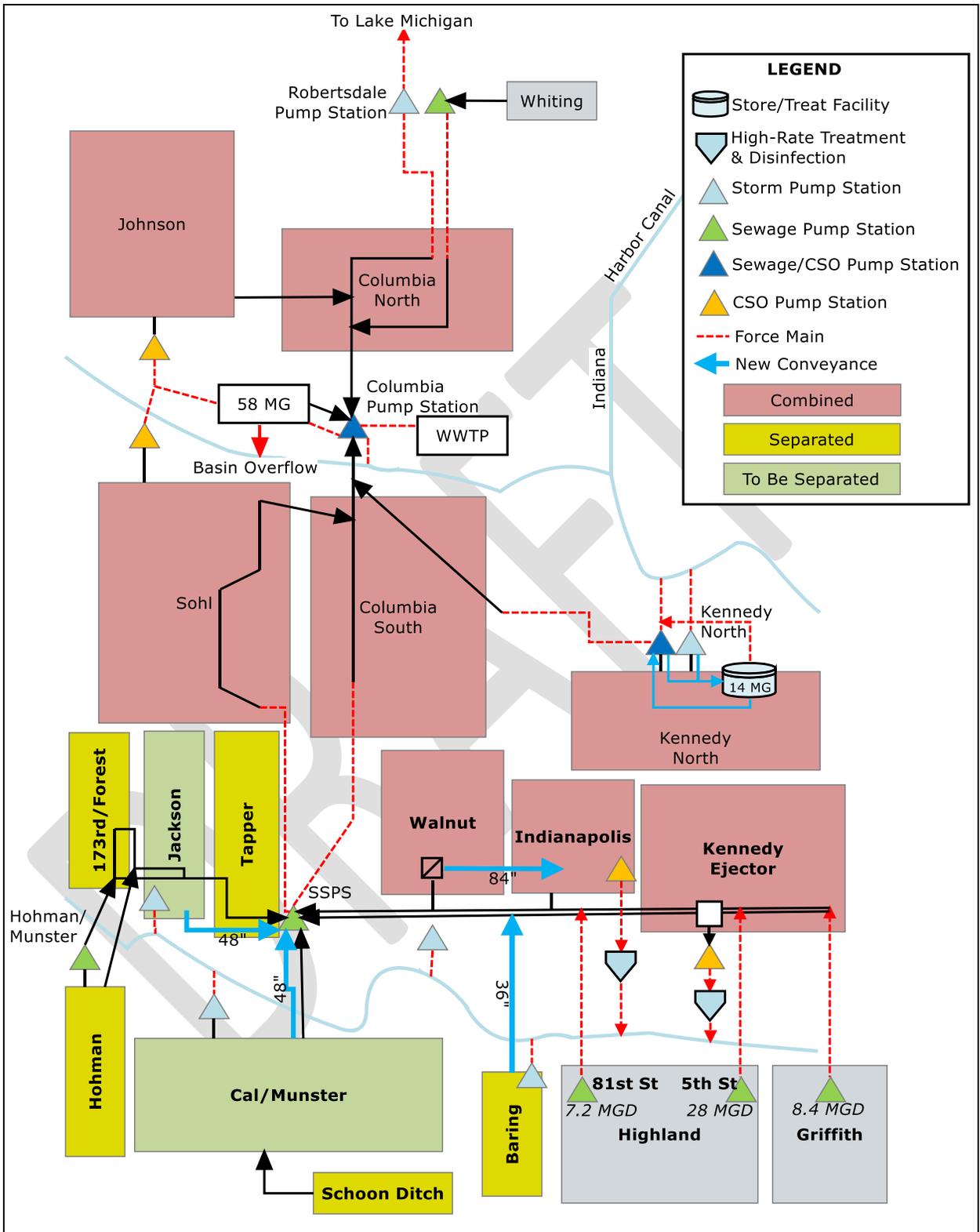


Figure 5 – Schematic of Alternative 5, NP-016 Basins, 1 discharge per year



Alternative 7 – NPD-016 Basins and Cloth Media Filter or High Rate Clarification

Long Term Control Plan Public Hearing

February 20, 2018

Recommended CSO Control Alternative



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Introduction / Background Summary of Public Hearings / Meetings

Date	Meeting
October 27, 2011	Introduction to the Planning Process
July 10, 2012	LTCP Alternatives
May 8, 2015	Preliminary Recommendations
February 20, 2018	Recommended CSO Control Alternative



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Presentation Outline

- What is a Long Term Control Plan?
- History of the LTCP for HSD
- Improvements to date
- Current status of the LTCP
- What's next?



What is a Long Term Control Plan?

First, what is a Combined Sewer Overflow (CSO)?



Sewer systems contain three types of sewers

Sanitary Sewers

- Sewage Only

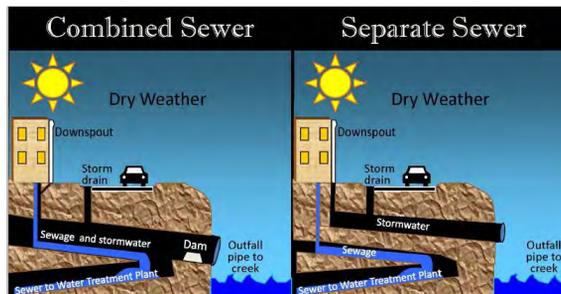
Storm Sewers

- Storm runoff only

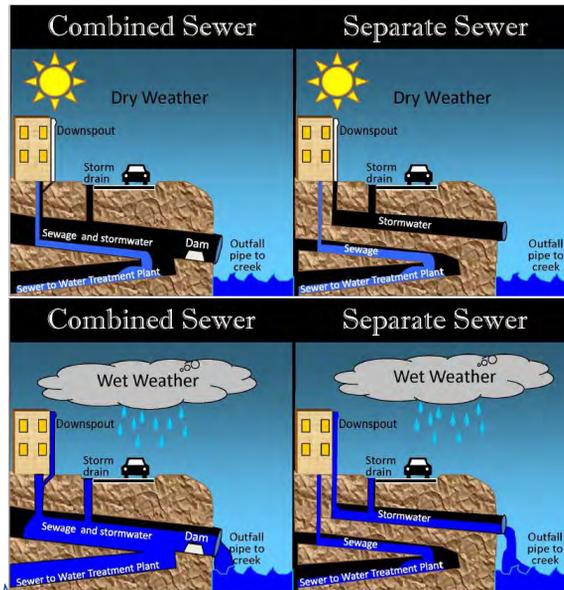
Combined Sewers

- Mixture of sewage and storm runoff

Combined vs. Separate Sewer Systems



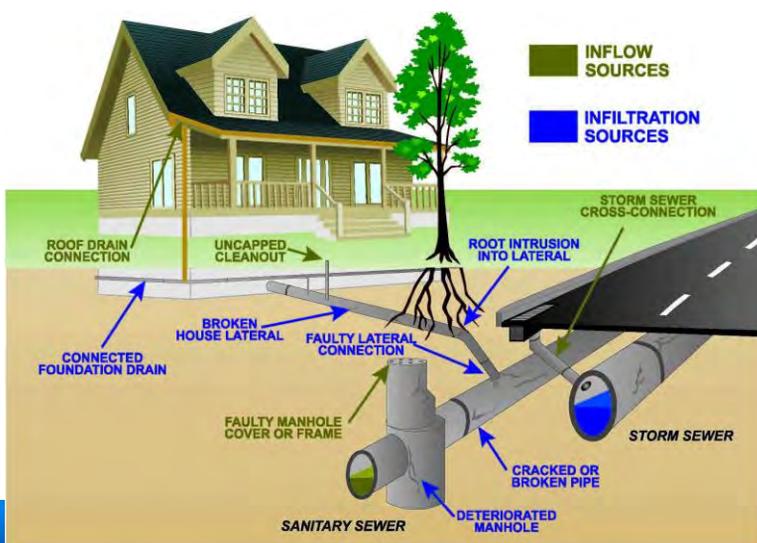
Combined vs. Separate Sewer Systems



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Sewer Separation

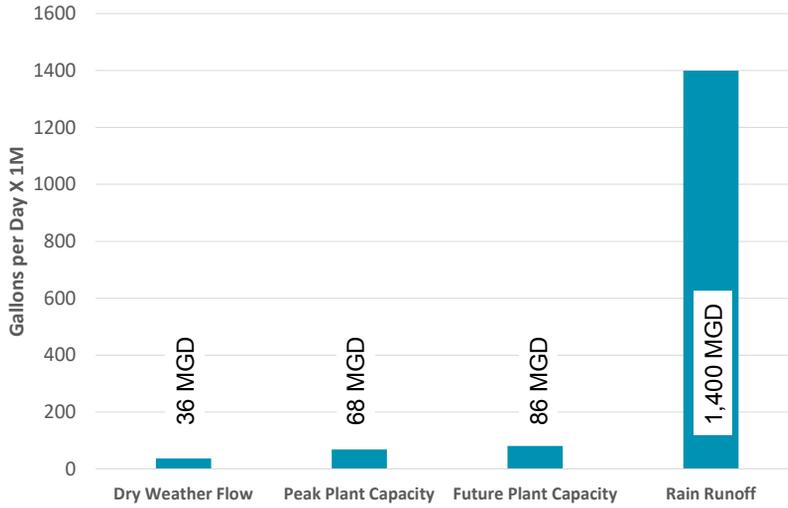


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- Disruptive
- Expensive
- Inflow & Infiltration

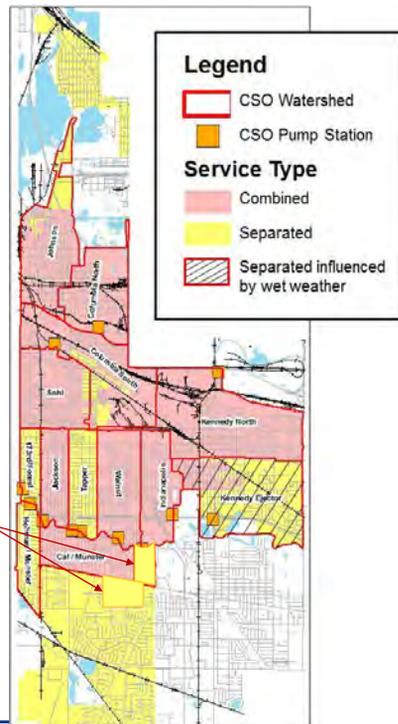
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Stats and facts about HSD's WWTP

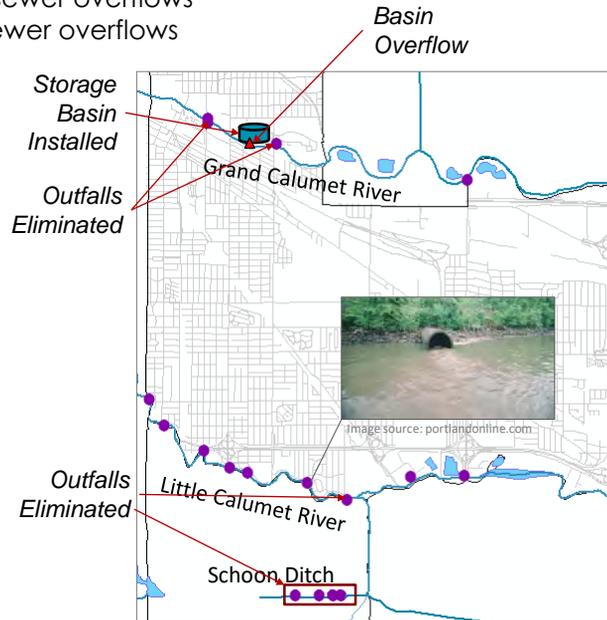


55% of HSD's service area is served by combined sewers (by area)

Separated since start of LTCP Process



2011: 17 combined sewer overflows
 2015: 9 combined sewer overflows



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What is a Long Term Control Plan?

- 772 cities in the US have combined sewer systems and are facing the same challenges as HSD
- To reduce pollution, EPA issued the Combined Sewer Overflow Control Policy, which mandates Cities to developed a Long Term Control Plan...



Image source: <http://cfpub.epa.gov/npdes/cso/demo.cfm>

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Key elements of EPA's CSO Control Policy



Goals and objectives of the LTCP

“Ensure all CSO discharges comply with the *technology-based and water quality-based* requirements of the Clean Water Act”

- EPA: *financial approach* – do what you can pay for
- IDEM: *technical approach* – do what will meet design storm criteria
- Everyone: Clean water & better health



IDEM's Ultimate Goal...



History of the LTCP in Hammond

- Originally submitted LTCP to IDEM in 1997...
 - IDEM performed a completeness review in 2003
 - Negotiation of terms of plan update began in 2004
- HSD continued to use this document as a roadmap for CSO reduction...
 - Revised plan submitted in June 2015
 - Received comments from IDEM & EPA
 - Requested that HSD evaluate further improvements
- HSD to submit updated LTCP on March 1, 2018

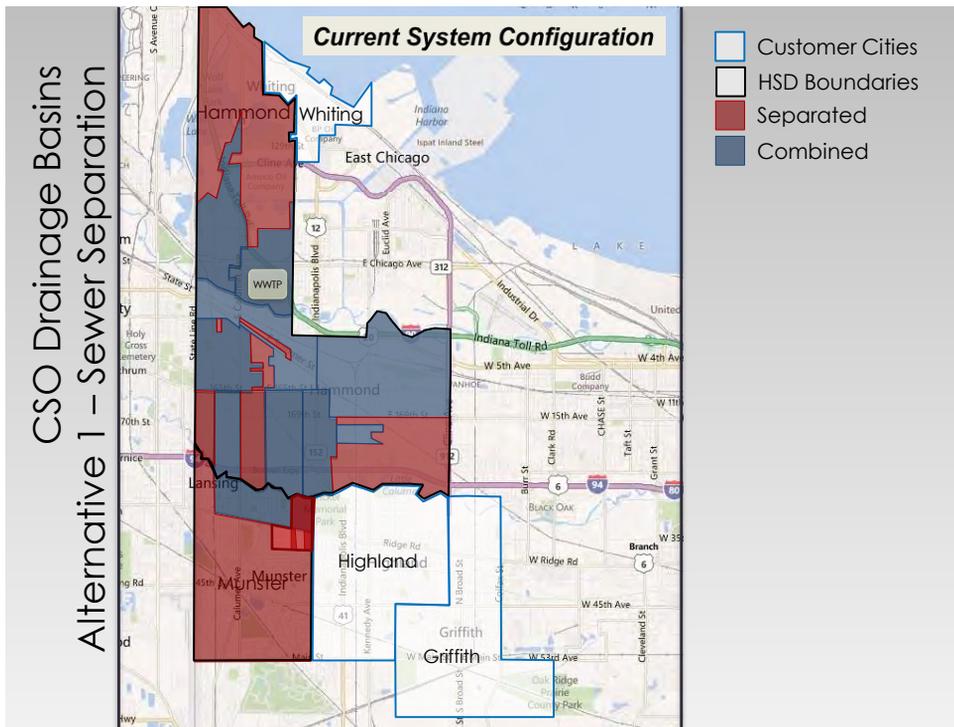
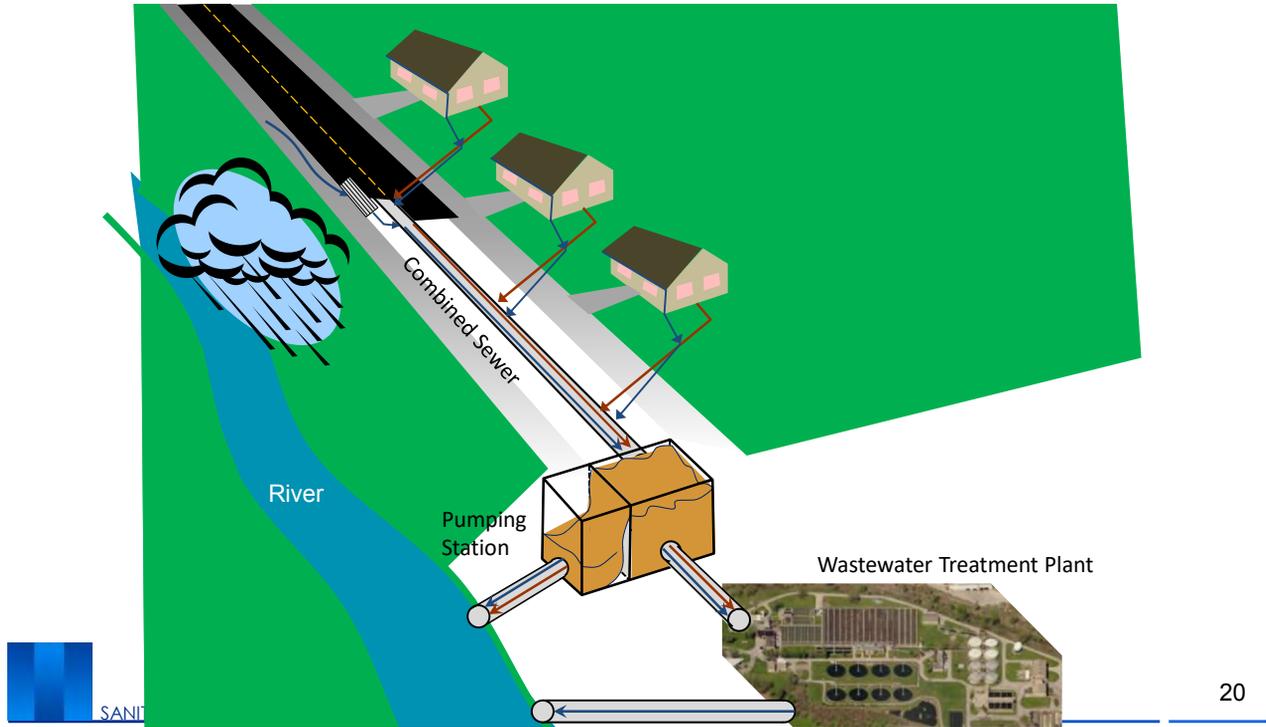
The LTCP lays out a strategy to reduce, treat, and/or eliminate CSOs

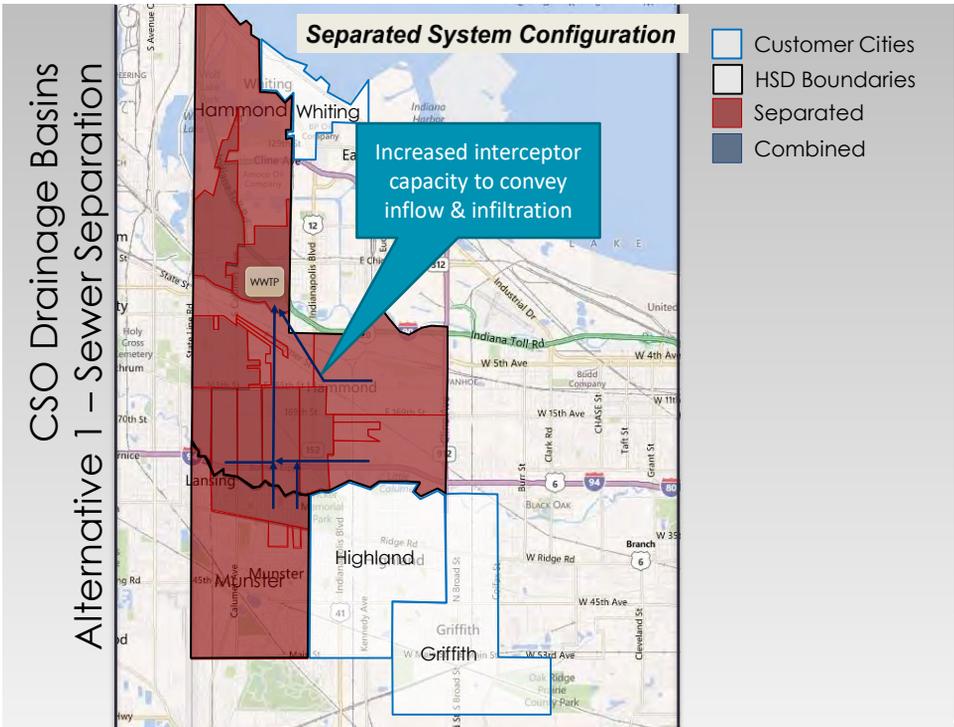
- The LTCP consists of 3 main engineering phases:



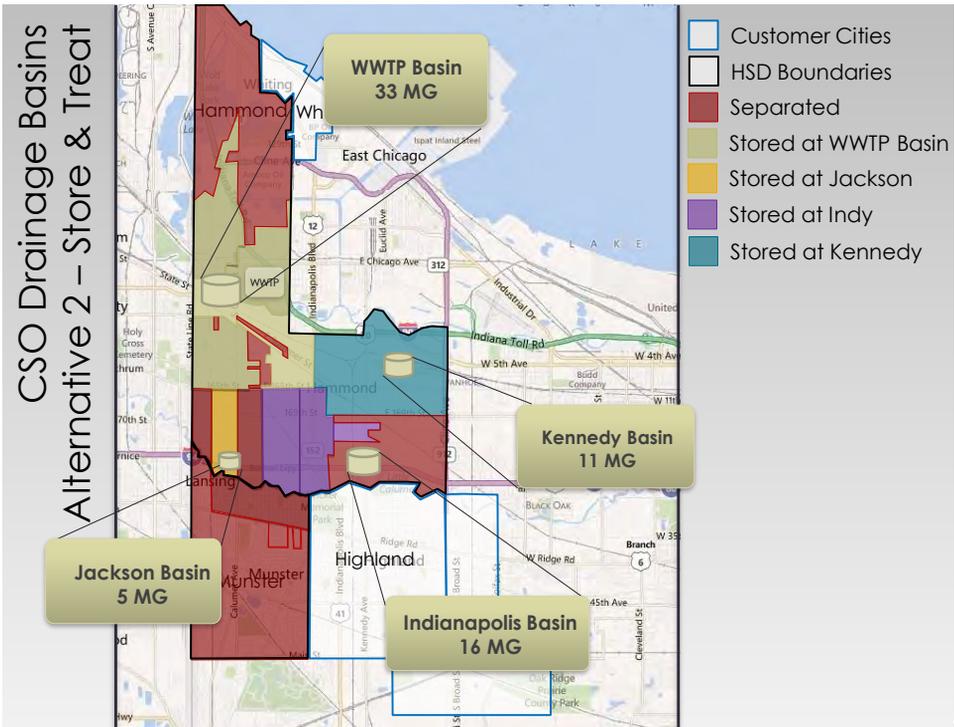
Alternatives Evaluated In June 2015 LTCP



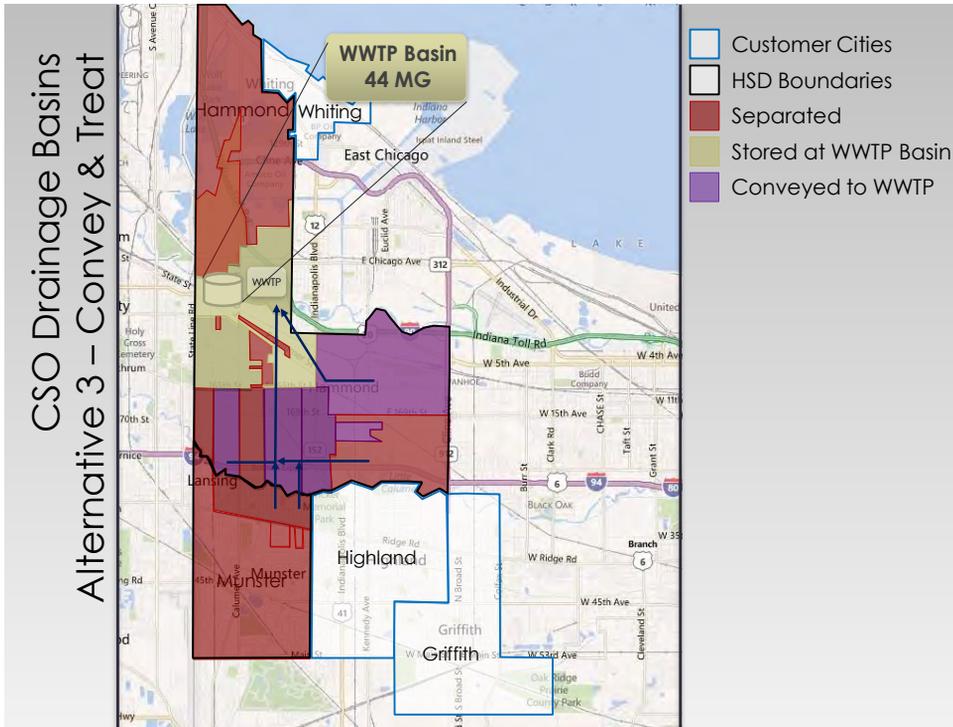




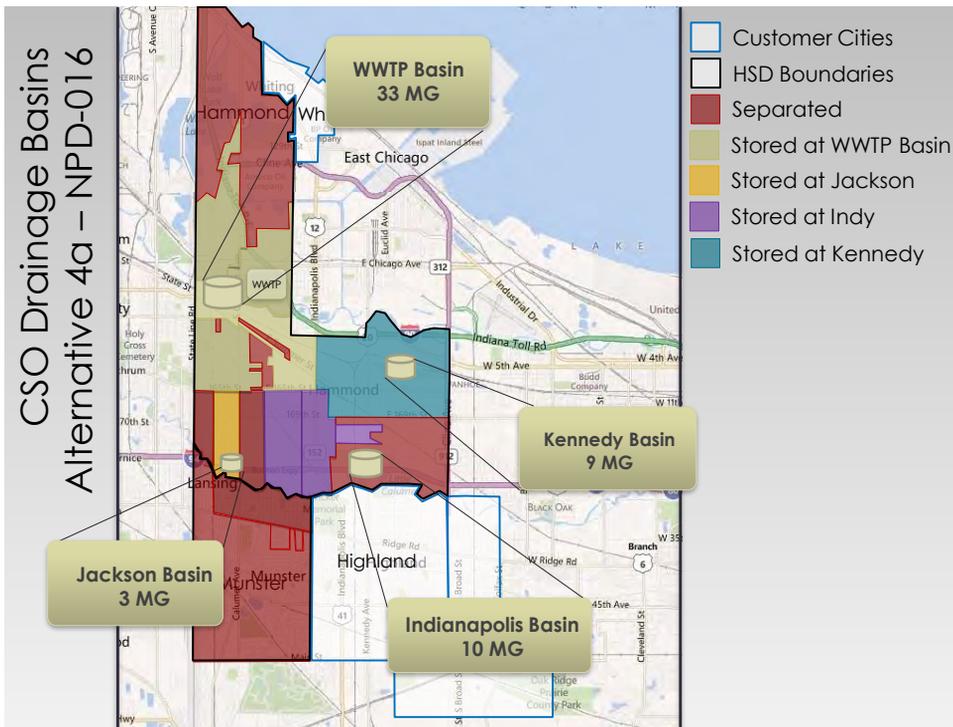
Alternative	Capital Cost
1	\$406M



Alternative	Capital Cost
1	\$406M
2	\$166M



Alternative	Capital Cost
1	\$406M
2	\$166M
3	\$318M



Alternative	Capital Cost
1	\$406M
2	\$166M
3	\$318M
4	\$158M

Capital Costs of LTCP Alternatives

- Alternative 1: Complete Sewer Separation
- Alternative 2: Store & Treat
- Alternative 3: Convey & Treat
- Alternative 4a: NPD-016
- Alternative 4b: NPD-016 + Green Infrastructure
- Alternative 4c: NPD-016 / Bird Sanctuary

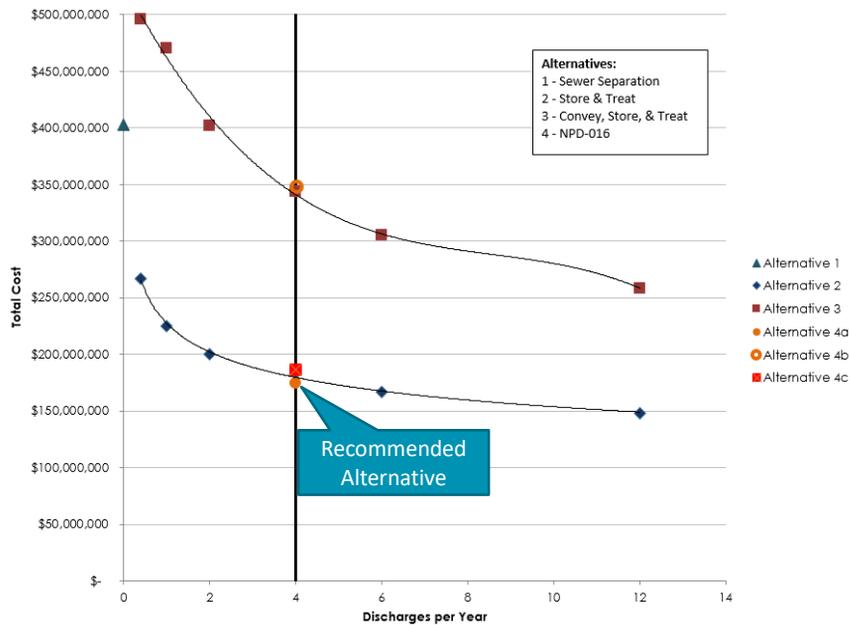
	Alt. 1	Alt. 2	Alt. 3	Alt. 4a	Alt. 4b	Alt. 4c
WWTP	\$30	\$30	\$30	\$30	\$30	\$30
GCR Total	\$194	\$61	\$129	\$60	\$87	\$60
LCR Total	\$182	\$65	\$149	\$58	\$99	\$71
Fine Screens		\$10	\$10	\$10	\$10	\$10
Grand Total	\$406	\$166	\$318	\$158	\$226	\$171

Total Present Worth of LTCP Alternatives

- Alternative 1: Complete Sewer Separation
- Alternative 2: Store & Treat
- Alternative 3: Convey & Treat
- Alternative 4a: NPD-016
- Alternative 4b: NPD-016 + Green Infrastructure
- Alternative 4c: NPD-016 / Bird Sanctuary

	Alt. 1	Alt. 2	Alt. 3	Alt. 4a	Alt. 4b	Alt. 4c
WWTP	\$34	\$34	\$34	\$34	\$34	\$34
GCR Total	\$189	\$68	\$139	\$67	\$128	\$67
LCR Total	\$180	\$72	\$156	\$63	\$177	\$75
Fine Screens		\$11	\$11	\$11	\$11	\$11
Grand Total	\$403	\$185	\$340	\$175	\$350	\$187

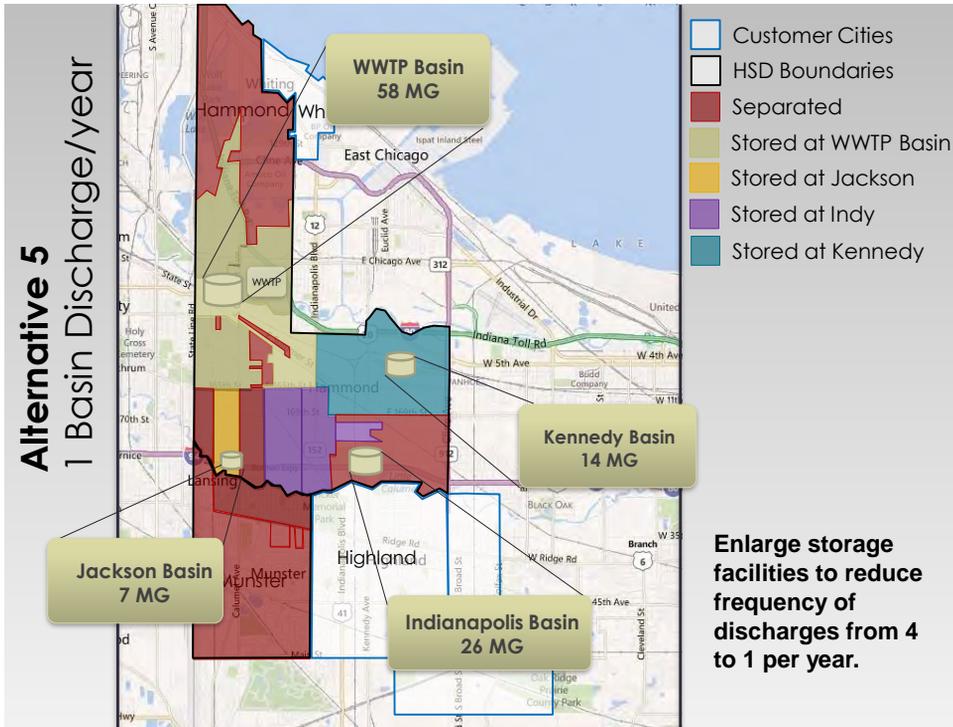
Cost-Effectiveness (Knee-of-the-curve)



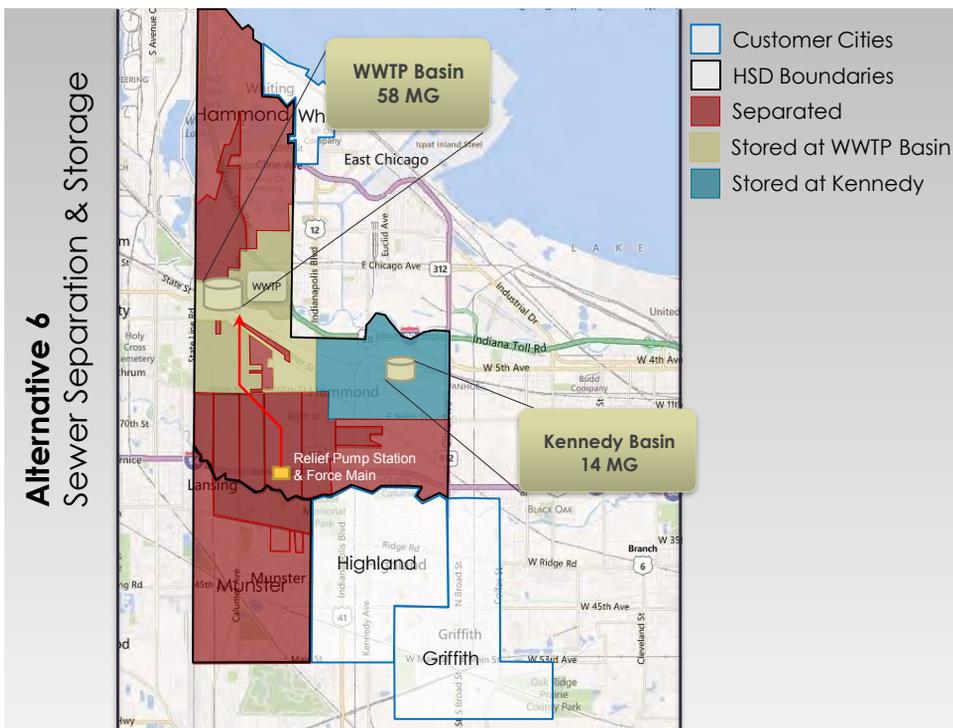
Outcome of EPA Meetings

Evaluate reducing the frequency of discharges from 4 to 1-2 per year.



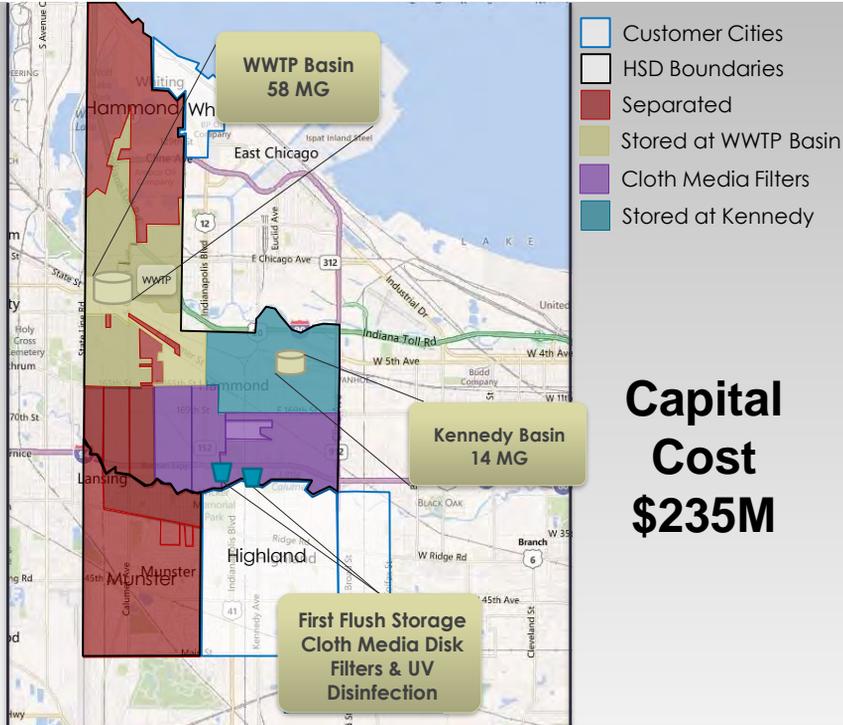


Alternative	Capital Cost
1	\$436M
2	\$196M
3	\$333M
4	\$188M
5	\$266M



Alternative	Capital Cost
1	\$436M
2	\$196M
3	\$333M
4	\$188M
5	\$266M
6	\$317M

Alternative 7
End-of-Pipe Treatment



Alternative	Capital Cost
1	\$436M
2	\$196M
3	\$333M
4	\$188M
5	\$266M
6	\$317M
7	\$235M

Capital Costs of LTCP Alternatives

- Alternative 1: Complete Sewer Separation
- Alternative 2: Store & Treat
- Alternative 3: Convey & Treat
- Alternative 4: NPD-016 (4 discharges/year)
- Alternative 5: NPD-016 (1 discharge/year)
- Alternative 7: Store & Treat (1 discharge/year) + CMDF

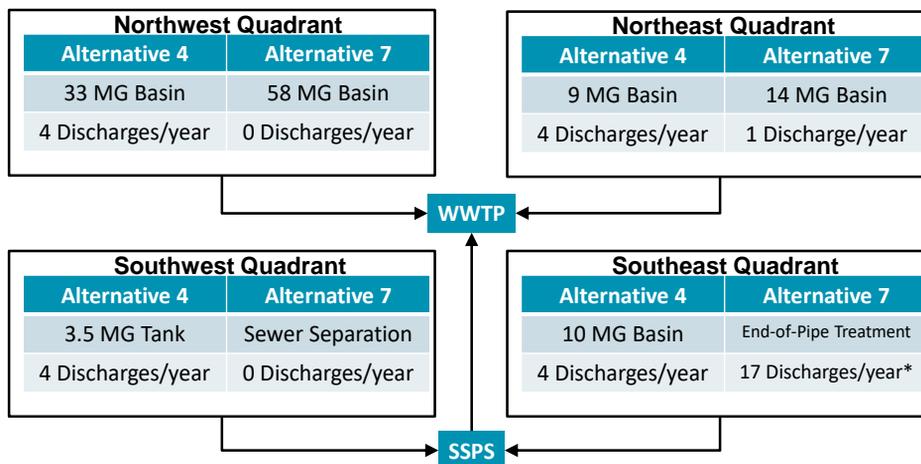
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
WWTP	\$60	\$60	\$60	\$60	\$83	\$60	\$60
GCR Total	\$194	\$61	\$114	\$60	\$84	\$101	\$84
LCR Total	\$182	\$65	\$149	\$58	\$89	\$156	\$81
Fine Screens		\$10	\$10	\$10	\$10		\$10
Grand Total	\$436	\$196	\$333	\$188	\$266	\$317	\$235

Total Present Worth of LTCP Alternatives

- Alternative 1: Complete Sewer Separation
- Alternative 2: Store & Treat
- Alternative 3: Convey & Treat
- Alternative 4: NPD-016 (4 discharges/year)
- Alternative 5: NPD-016 (1 discharge/year)
- Alternative 7: Store & Treat (1 discharge/year) + CMDF

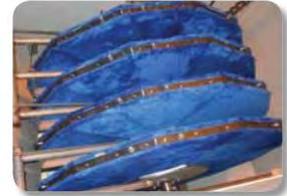
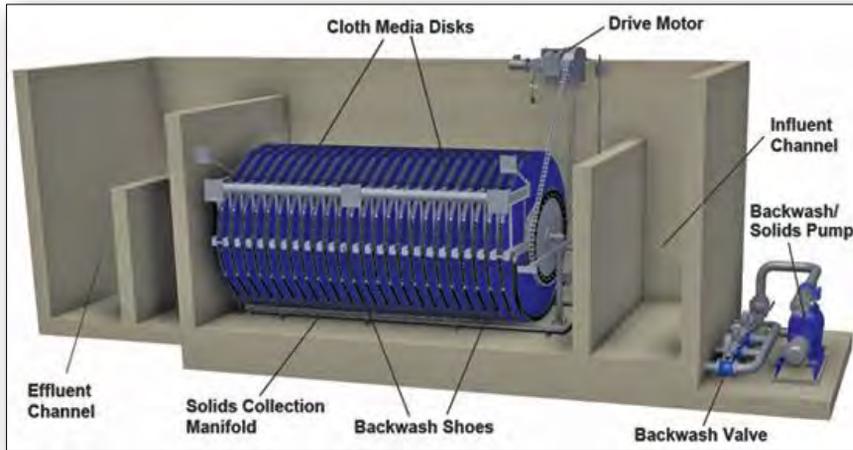
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7
WWTP	\$69	\$69	\$69	\$69	\$95	\$69	\$69
GCR Total	\$194	\$68	\$125	\$70	\$103	\$163	\$103
LCR Total	\$182	\$72	\$157	\$63	\$92	\$156	\$88
Fine Screens		\$10	\$10	\$10	\$10		\$10
Grand Total	\$446	\$220	\$361	\$213	\$300	\$388	\$270

Comparison of Alternatives 4 & 7



*Treated to a quality approaching secondary effluent + disinfection

Cloth Media Disk Filters



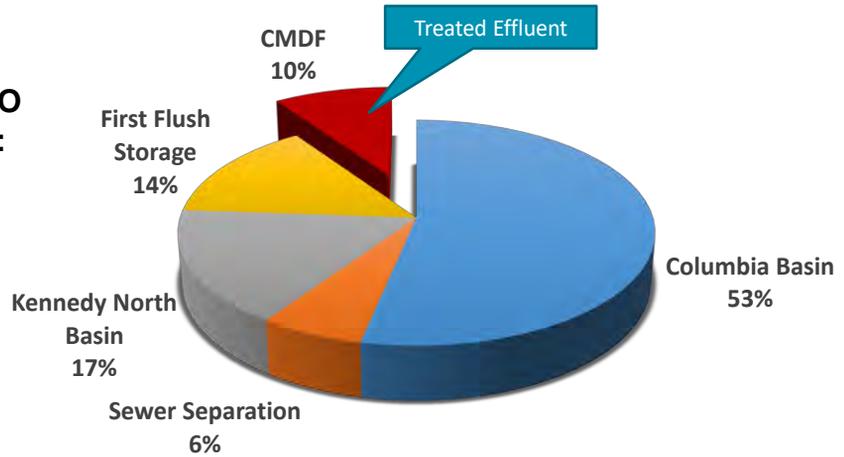
OptiFiber PES-14®

Selected Plan:

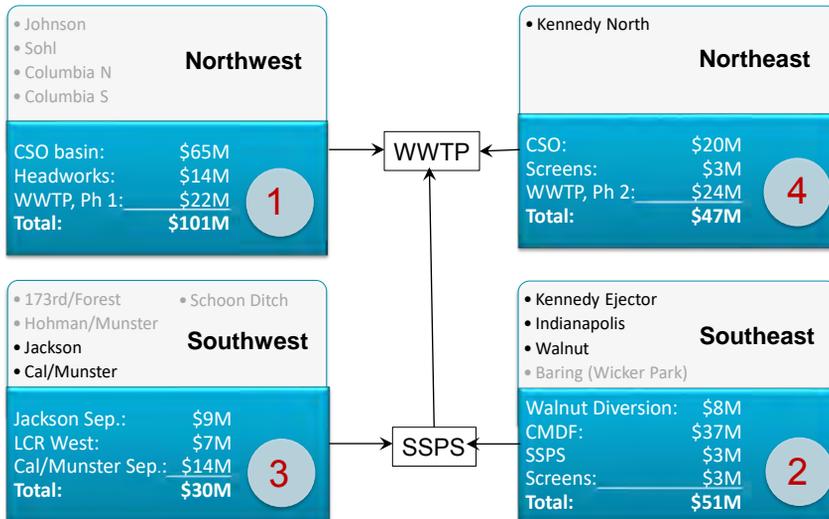
Alternative 7 Store/Treat & CMDF

Reduction In Annual Average CSO Volume

Annual Average CSO Discharge Volume: 1,400 MG

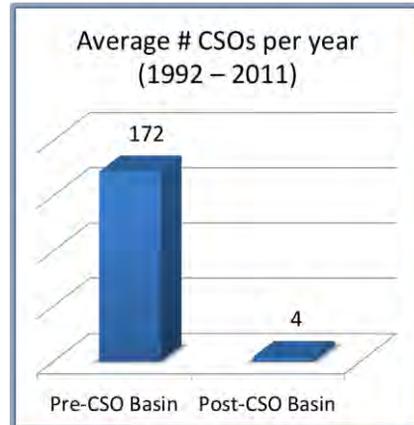


Selected Plan Elements / Status



The CSO basin has dramatically reduced CSOs to the Grand Calumet River

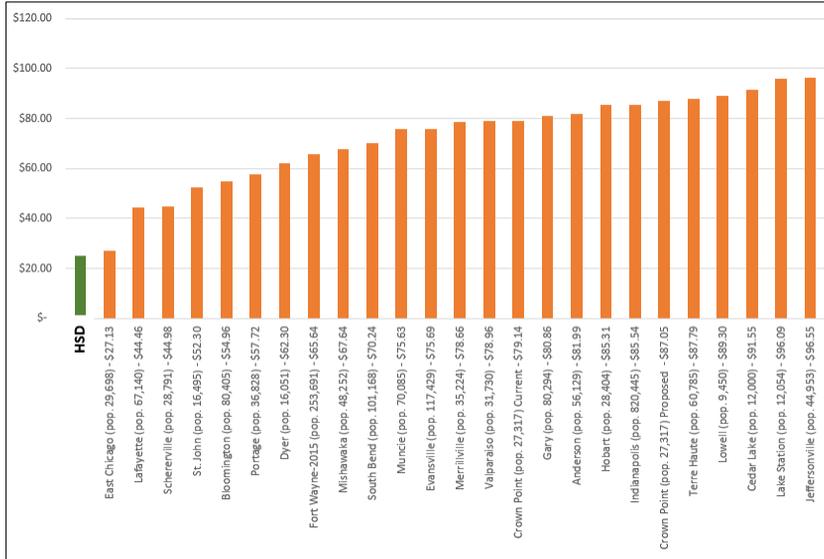
- Pre-CSO Basin
 - CSO Outfalls would discharge *172 times per year, on average*
- Post-CSO Basin
 - Discharges from existing outfalls *eliminated*
 - The CSO basin overflows *4 times per year, on average*
 - Discharges are settled to remove solids and disinfected



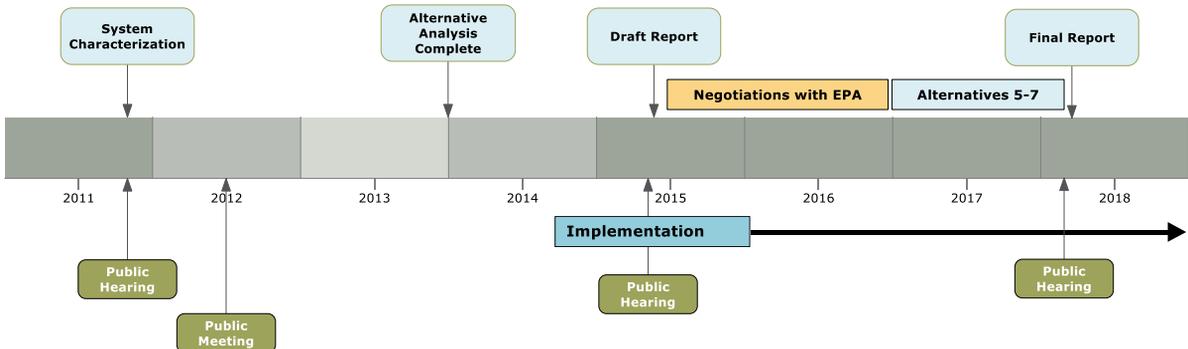
So how will this affect user rates?



Comparison of Indiana Sewer Rates

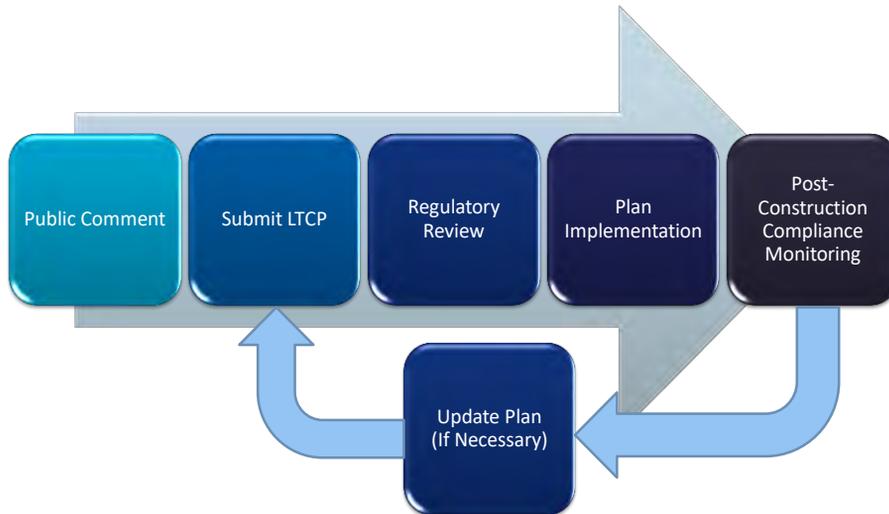


Current Status of LTCP



Construction Complete in 2035

What's next?



More info on City's Web page...

HAMMOND SANITARY DISTRICT

Home Departments Info Links CSD Contact

Long Term Control Plan

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Alternative 7a:	NPD-016 CSD Basins** and Cloth Media Filter	See Figure 7
Alternative 7b:	NPD-016 CSD Basins** and High Rate Clarification	See Figure 7

** 4 discharges per typical year

<http://www.hammondsd.com/long-term-control-plan/>

[questions?]

[comments?]



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